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present. We found that the spectrum of the nucleus is a band of continuous light, upon which the two green bright lines of nebium are superimposed. We were unable to decide from the visual observation whether the bright $H\beta$ hydrogen line is present or not. We have photographed the spectrum of this object, using three-prism dispersion and a camera of six inches focal length, exposure 13 hours. The nebium radiations 5007 and 4959A, and the $H\beta$ radiations are the only features recorded. These radiations are not monochromatic; they form bands several angstrom units in width, and the centers of the three bands are displaced toward the red about 15 units from the normal positions of the corresponding nebular bright lines. The measures of the displacements indicate a radial velocity of recession amounting to 940 kilometers per second. The positions of the maxima of the three bands cannot be very accurately estimated and the assigned velocity may be in error by as much as 30 or 40 kilometers. The bands have about the average relative intensities found in the planetary nebulae, 10:3:1.

Dr. Curtis simultaneously secured a Crossley photograph with this object centered on the plate and the spiral structure is clearly evident.

The character of the spectrum resembles that of the spiral nebula N. G. C. 1068 (R. A. = $2^h 37^m.6$).

W. W. CAMPBELL,
G. F. PADDOCK.

NOTE ON THE MOTION IN SOME A DOUBLE STARS

Two earlier notes on the motion observed in some of the double stars discovered by me have been printed in these PUBLICATIONS. The work of remeasurement of the A pairs has been continued during the past year and a number of additional ones have been found to be in relatively rapid motion. A few of those in which the change is most decided are included in the following table, the columns of which give, in order, the star's number, the interval, in years, between the discovery measure and the later observation, the change in position angle, the distance at discovery, the change in distance and the magnitudes. Many other pairs show change in angle ranging from 5° to 15° , and in most cases this is due to the orbital motion; in some instances, doubtless, it may be due to errors of measure. In all, about 1,700 pairs have now been remeasured after an interval of from 8 to 17 years, and indications

of motion have been found in about 17 per cent. In about 10 per cent the change is large enough to put the fact of motion in the interval beyond question.

Star	Δ Epoch	$\Delta \theta$	ρ disc.	$\Delta \rho$	Mags.
A 337	14. 99	$-34^{\circ}.6$	$0''.27$	$+0''.07$	7.9—8.2
A 349	14. 6	$-20^{\circ}.6$	0.56	-0.04	8.5—9.2
A 578	14. 0	$-23^{\circ}.2$	0.22	$+0.05$	8.6—9.3
A 750	13. 0	$-22^{\circ}.5$	0.30	-0.13	8.5—9.2
A 793	12. 6	$-28^{\circ}.9$	0.16	-0.02	8.6—8.7
A 1293	10. 1	$+23^{\circ}.4$	0.32	$+0.06$	8.2—8.6
A 1493	11. 1	$-27^{\circ}.3$	0.20	$+0.01$	9.0—9.2
A 1653	10. 0	$-21^{\circ}.3$	0.22	0.00	7.6—8.6
A 1658	10. 1	$-44^{\circ}.1$	0.23	0.00	8.2—8.3
A 1688	10. 0	$+20^{\circ}.1$	0.24	0.00	9.2—9.2
A 1866	9. 0	$+60^{\circ}.1$	0.25	$+0.05$	9.5—9.7
A 2003	8. 0	$+33^{\circ}.9$	0.20	0.00	9.2—9.2
A 2244	7. 0	$+23^{\circ}.9$	0.27	-0.07	8.3—8.4

It will be noted that, in nearly every instance, the measured distance at discovery was $0''.3$ or less, and that in about one-half of the number the second distance measure is the smaller one. The star A 349 is probably comparatively near our own system and may have a measurable parallax; a measure in 1910 confirms the angular motion. The most interesting star in the table is A 1866, which constitutes the fainter component of the pair β 627. This system is certainly a triple one, for a wider pair is also in direct orbital motion, as is evident from the following measures:

		β 627	Mag.		
1878.38	$309^{\circ}.4$	$1''.83$	5.0—10.5	5n	Burnham
1898.61	$314^{\circ}.5$	1.90	— 9.3	3	Aitken
1908.66	$319^{\circ}.7$	1.54	— 9.0	2	Aitken
1917.66	$328^{\circ}.8$	1.53	— 9.1	2	Aitken

The bright star has the proper motion $0''.073$ in $210^{\circ}.7$ and the fainter stars are moving with it. It is probable that the angular distance in the faint pair is now near its maximum value.

The close pair A III AB, whose discovery was mentioned in one of the earlier notes, has proved to be in very rapid motion. My measures are:

	A III AB		
1915.71	$262^{\circ}.5$	$0''.22$	2n
1916.71	$241^{\circ}.2$	0.18	2n
1917.90	$208^{\circ}.1$	0.15	3n

Another pair showing unusual motion is A 351, also mentioned in an earlier note. For convenience, I print the earlier measures with the two secured this year:

	A 351		
1902.48	65°.4	0".55	4n
1910.31	75°.8	0".38	2
1916.58	220°.3	0".19	1
1917.67	227°.2	0".28	2

When these positions are plotted, it is seen that it is quite impossible to predict the future motion. It is probable that both this pair and A 111 have parallaxes large enough to be measured by the photographic method.

January, 1918.

ROBERT G. AITKEN.

TWO NEW CLOSE BINARY STARS

In 1904 the 7.0 star, B. D. +68°.64 was noted with the 12-inch telescope as "probably close"; in 1906, the 7.0 star B. D. +52.640, which is the well-known double star, Σ 314, was examined with the 36-inch and the note made that the brighter component was "possibly very close." Neither pair was examined again until October 1917, when each was found to be really double. My measures are:

B. D. + 68°.64				
	0 ^h 54 ^m 55 ^s	+ 68° 49'	(1900.0)	
	Angle	Dist.	Mag.	n
1917.85	9°.9	0".18	7.6—7.6	2
B. D. + 52°.640				
	2 ^h 45 ^m 45 ^s	+ 52° 35'	(1900.0)	
1917.86	115°.5	0".23	7.9—9.2	2 A and B
	ASB and C = Σ 314			
1917.86	303°.2	1".42	7.6—7.9	2

Measures of Σ 314 indicate a very slow increase in angle since 1830, with no certain evidence of change in distance. There is also, according to Greenwich observations, a small proper motion of 0".014 in 119°.5. If this is real, it must be common to all of the components. The new close pair probably has a relatively short revolution period.

January, 1918.

R. G. AITKEN.